

City of Glendale Water and Power

AMI Smart Grid Initiative

Abstract

The City of Glendale Water and Power's (Glendale) Advanced Metering Infrastructure (AMI) Smart Grid Initiative project involves system-wide deployment of advanced meters, use of customer systems and in-home displays, installation of distribution automation equipment systems, and management of distributed energy storage. The project aims to reduce peak loads, overall electricity use, and operations and maintenance costs while increasing distribution system efficiency and reliability.

The project implements secure wireless communications to (1) allow customers to view their electricity consumption through Web portals and displays at any time, and (2) allow Glendale to manage, measure, and verify targeted demand reduction during peak periods. In addition to the AMI deployment, Glendale is upgrading selected feeders with distribution automation equipment to improve the operational efficiency as well as system reliability.

Smart Grid Features

Communications infrastructure includes an ethernet/Internet protocol backhaul and a local wireless radio frequency network that enables two-way communication between meters and utility data systems and allows for the monitoring and control of select distribution automation equipment. Data management systems enable Glendale to develop actionable information from equipment notifications and customer electricity usage data. All capacitor banks include advanced controllers with communications devices that are remotely controlled via the supervisory control and data acquisition (SCADA)/distribution management system.

Advanced metering infrastructure includes deployment of 86,526 smart meters. These meters provide the capability for a variety of current and future customer electricity price and service options and reduce Glendale's costs of electricity delivery. Operational cost savings come from lower meter reading and customer

At-A-Glance

Recipient: City of Glendale Water and Power

State: California

NERC Region: Western Electricity Coordinating Council

Total Budget: \$51,302,105

Federal Share: \$20,000,000

Project Type: Advanced Metering Infrastructure and
Customer Systems
Electric Distribution System

Equipment

- 86,526 Smart Meters
- AMI Communication Systems
 - Meter Communications Network
 - Backhaul Communications
- Meter Data Management System
- Up to 80,000 Home Area Networks
- Customer Web Portal Access for 80,000 Customers
- Up to 30,000 In-Home Displays
- 1.5 MW of Distributed Energy Storage Devices
- Distribution Automation Equipment for 4 out of 11 Circuits
 - Distribution Management Systems
 - Distribution Automation Communications Network
 - Automated Distribution Circuit Switches
 - Automated Capacitors
 - Equipment Condition Monitor

Time-Based Rate Programs Targeting up to 80,000 Customers

- Time of Use
- Critical Peak Pricing

Key Targeted Benefits

- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Deferred Investment in Distribution Capacity Expansion
- Improved Electric Service Reliability and Power Quality
- Reduced Costs from Equipment Failures and Distribution Line Losses
- Reduced Truck Fleet Fuel Usage
- Reduced Greenhouse Gas and Criteria Pollutant Emissions

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services costs. New AMI features such as outage and restoration notification and a remote service switch enable Glendale to respond to outages and customer requests more efficiently.

Advanced electricity service options offered through the project include in-home displays and Web portals facilitating two-way information exchange, providing the ability for customers to view their consumption and manage their bills.

Time-based rate programs include time-of-use and critical peak pricing programs. Glendale expects customers participating in these programs to reduce peak demand or shift consumptions from peak- to off-peak periods, which can reduce overall electricity costs.

Distribution automation systems include the demonstration of automated feeder switches, feeder monitors, remote fault indicators, and automated capacitor controls on select feeders. The distribution automation devices are using the AMI communications infrastructure to detect and isolate outages to minimize the number of customers affected and duration of the outage. Additionally, these devices are being implemented in conjunction with a distribution management system, a load management system, and an outage management system. The combination of the distribution automation devices and the enterprise applications enables Glendale to improve distribution loading conditions and system reliability.

Distribution system energy efficiency improvements involve the integration of automated capacitor with a power quality monitoring system. The capacitors improve voltage and volt ampere reactive (VAR) control, power quality, and distribution capacity by reducing energy losses on the distribution system.

Electric vehicle charging stations are being deployed to understand and manage the effects of increased loading on the distribution system. The charging stations provide Glendale with information necessary to develop electricity service options and pricing programs for customers with electric vehicles.

Distributed energy resources interface and control systems involve information systems for managing peak load and energy costs for 214 thermal energy storage units, which represent approximately 1.5 MW.

Timeline

Key Milestones	Target Dates
AMI asset deployment begins	Q2 2010
Distribution automation pilot asset deployment begins	Q3 2011
AMI asset deployment complete	Q3 2011
Distribution automation pilot asset deployment complete	Q3 2012

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